

CLAIMS

1. An apparatus for driving a device with compressed air comprising:
a compressed air source;
a device operable with air supplied from said source via a compressed air
5 supply line;
a heated fluid source for providing a heated fluid proximate the at least one
device via a heated fluid supply line;
a heat exchanger connected to the compressed air supply line and the heated
fluid supply line;
10 wherein the heat exchanger transfers heat energy from the heated fluid to the
compressed air, thereby elevating the temperature of the air sufficiently that upon
decompression and driving of the device the temperature of the air remains higher
than an ambient dew point.
- 15 2. The apparatus of claim 1 wherein the heated fluid source supplies water that is
at least about 130° F.
3. The apparatus of claim 2 wherein upon passing through the heat exchanger the
temperature of the air is increased up to about 125° F and wherein upon
20 decompression the temperature of the air drops to no lower than about 76° F.
4. The apparatus of claim 3 wherein upon passing through the heat exchanger the
temperature of the air is increased to about 125° F and upon decompression the
temperature of the air drops to about 76° F.
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5. The apparatus of claim 1 further comprising a flow control valve positioned in
the fluid supply line and operable to adjust a fluid flow rate therethrough.
6. The apparatus of claim 5 further comprising a temperature sensor operable to
30 indicate an approximate temperature of air after passing through the heat exchanger.
7. The apparatus of claim 1 wherein the heat exchanger comprises coaxial
portions of the compressed air supply line and the heated fluid supply line.

8. The apparatus of claim 1 further comprising a barrier substantially fluidly and electrically isolating the compressed air driven device from the heated fluid source.
9. A system for the application of liquid materials to a substrate comprising:
5 a compressed air source;
an application booth;
a rotary device positioned in the application booth for atomizing and spraying a liquid material, wherein the rotary device is driven by decompressing air supplied from the compressed air source;
10 a heated fluid source;
a heat exchanger for heating the compressed air prior to driving the rotary device by transferring heat thereto from fluid supplied by the heated fluid source;
wherein the heat exchanger is positioned sufficiently proximate the rotary device such that air heated thereby does not upon decompression fall to a dew point
15 temperature.
10. The system of claim 9 wherein the application booth is electrically isolated from the heated fluid source.
- 20 11. The system of claim 9 further comprising a plurality of rotary devices driven by decompressing air supplied from the compressed air source.
12. The system of claim 11 further comprising a plurality of heat exchangers, each said heat exchanger being mounted proximate one of said plurality of rotary devices.
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13. The system of claim 12 further comprising:
a plurality of application booths;
a plurality of parallel arranged heated fluid supply lines, each of said supply lines being connected to one of said plurality of heat exchangers;
30 wherein each of said heat exchangers provides heated compressed air to one of said plurality of application booths.

14. The system of claim 9 wherein the liquid material supplied to the rotary device comprises a paint, and wherein the rotary device comprises a rotatable atomization disk driven by decompressing air, the rotary device being mounted in a painting bell.

5 15. A method of controlling condensation in a liquid spraying apparatus comprising the steps of:

connecting a compressed air supply line with a device at which air is decompressed;

10 connecting the compressed air supply line to a heat exchanger and passing compressed air therethrough;

connecting a supply line carrying heated fluid to the heat exchanger such that the heated fluid can elevate the temperature of the compressed air in the heat exchanger;

15 supplying the compressed air passed through the heat exchanger to the device at a temperature sufficient that upon decompression the air does not cool the device to an ambient dew point.

16. The method of claim 15 wherein the heat exchanger is positioned sufficiently proximate the device that the compressed air passed therethrough arrives at the device
20 at a sufficiently elevated temperature such that upon decompression the air does not cool the device to an ambient dew point.

17. The method of claim 15 wherein the heat exchanger is supplied with heated
fluid at a temperature sufficient that the compressed air passed therethrough arrives at
25 the device at a sufficiently elevated temperature such that upon decompression the air does not cool the device to an ambient dew point.

18. The method of claim 15 wherein the step of connecting a supply line to the heat exchanger comprises connecting a supply line carrying fluid that is at least about
30 130° F.

19. The method of claim 18 wherein the compressed air is heated to about 125° F in the heat exchanger.

20. The method of claim 19 wherein the step of supplying the air to the device comprises supplying air heated in the heat exchanger sufficiently that upon decompression the temperature of the air drops to no lower than about 76° F.

5 21. The method of claim 15 further comprising the steps of:
monitoring the approximate temperature of air supplied to the device; and
adjusting the flow rate of the heated fluid to the heat exchanger to provide for
heating of the air sufficiently that upon decompression the air does not cool the device
to an ambient dew point.

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22. The method of claim 21 wherein the step of monitoring the temperature of air supplied to the device comprises monitoring the temperature of fluid supplied to the heat exchanger.

15 23. The method of claim 15 further comprising the steps of:
monitoring the approximate temperature of air supplied to the device; and
adjusting the temperature of the heated fluid supplied to the heat exchanger to
provide for heating of the air sufficiently that upon decompression the air does not
cool the device to an ambient dew point.